

NEW OYSTERS AND A NEW PECTEN FROM
THE TERTIARY OF CALIFORNIA

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Ostrea ashleyi Hertlein, new species

Plate 1, figures 2 and 3; Plate 2, figure 1

Lower valve narrowly oblong, wider at base; exteriorly ornamented by numerous fluted ribs; area of attachment near beak unornamented. Interior of margin not folded; muscle scar fairly large; ligament groove long and fairly wide. Upper valve long and narrow; on the interior beneath the beak a long narrow elevated area is present which fits into the groove of the lower valve. Height of shell (beak to base, incomplete), 216 mm.; width of shell (at base) 108 mm.

Holotype: Lower valve, No. 6065 (C. A. S. type coll.) from Loc. 933 (C. A. S.) Kern County, California; Chas. Morrice collector; Temblor, Miocene [= Loc. 981 (C. A. S.) near the center of Sec. 32, T.28 S., R.29 E., M. D. M. F. M. Anderson collector, Temblor, Middle Miocene]. Paratype: upper valve No. 6072 (C. A. S. type coll.) from Loc. 1073 (C. A. S.), from forks of large gulch which runs from the north through the middle of the E. $\frac{1}{2}$ of Sec. 28, T.28 S., R.29 E., M. D. M., Kern County, California; about one kilometer above falls on central hill slope; G. D. Hanna collector; Temblor, Miocene. A paratype of this species has been deposited at the San Diego Society of Natural History, San Diego, California.

This species is abundant at Loc. 1073 (C. A. S.). Mr. A. R. May of Bakersfield, California, has studied the field relationship at this locality, and kindly furnished the following information:*

"Locality No. 1073 occurs on the east bank of the creek about twenty feet above the creek bed, at an elevation of approximately 710 feet. The Round Mountain Silt-Olcese Sand ("Middle Temblor Sands") contact occurs on the hill side to the east of the locality at an elevation of 925 feet. The dip of the beds is about 5 degrees to the south and the oyster bed consequently is between 200 and 210 feet below the top of the Olcese Sand."

This long narrow oyster with pronounced ribs ornamenting the lower valve, which bears a long ligament groove, internally, is quite distinct from any other species from western North

*Written communication to Dr. G. D. Hanna, dated November 8, 1933. Letter in files of the California Academy of Sciences.

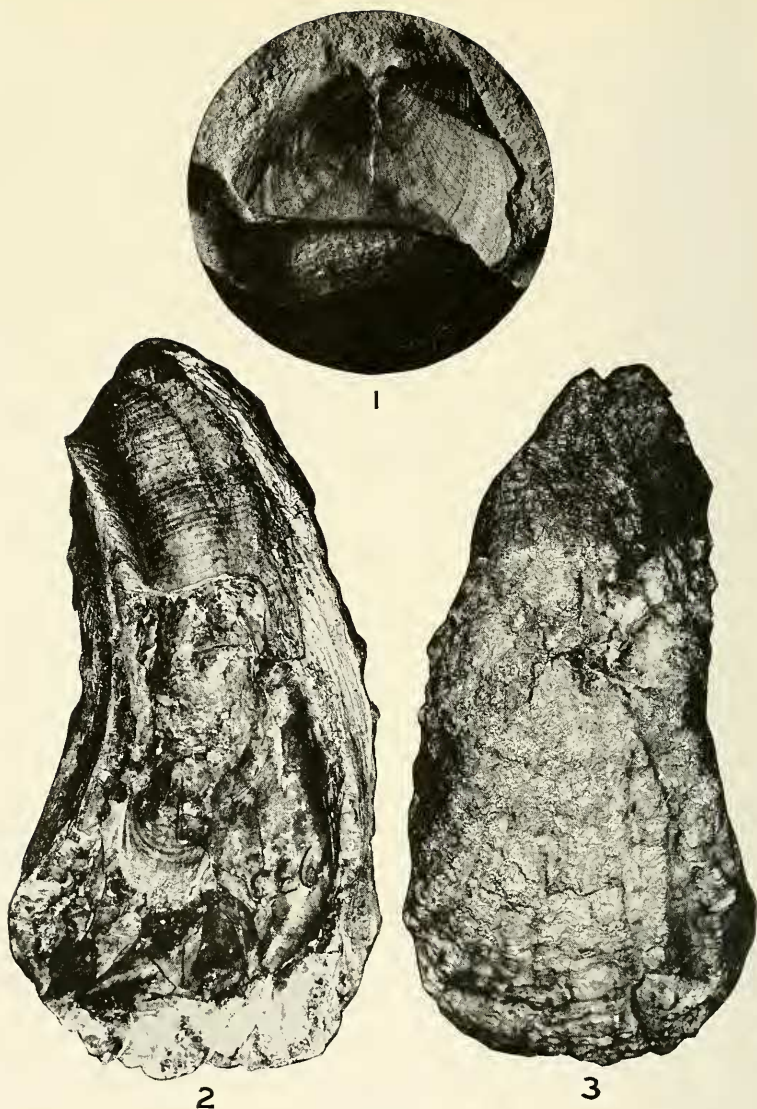


PLATE 1

FIG. 1. *Pecten (Pseudamusium) lillisi* Hertlein, new species. Paratype: left valve, No. 6063 (C. A. S. type coll.) from Loc. 1874 (C. A. S.) diatomite from S. E. corner of Sec. 35, T. 6 S., R. 7 E., M. D. M., Stanislaus County, California, north side of Crow Creek road. Bedded material in quarry, dip nearly flat. G. D. Hanna and J. A. Taff, collectors; Kreyenhagen formation, upper Eocene or lower Oligocene. Height of figured specimen (incomplete) approximately 20.5 mm., length (incomplete) approximately 16.5 mm.

FIG. 2. *Ostrea ashleyi* Hertlein, new species. Holotype: lower valve, No. 6065 (C. A. S. type coll.) from Loc. 933 (C. A. S.) Kern County, California; Temblor, Miocene. Chas. Morrice collector. [= Loc. 981 (C. A. S.) near center of Sec. 32, T. 28 S., R. 29 E., M. D. M. F. M. Anderson collector; Temblor, Miocene.]

FIG. 3. *Ostrea ashleyi* Hertlein, new species. Exterior of same specimen as figure 2.

America. These features of the lower valve as well as the long narrow upper valve with the internally raised area below the beak, easily distinguish the species from other lower Miocene forms such as *O. loeli* Hertlein,¹ *O. wideyi* Hertlein,² and *O. howelli* Wiedey.³

In some cases this species has apparently been referred to *O. bourgeoisii* Rémond.⁴ Rémond's type was not illustrated at the time of description and it is possibly lost. Gabb⁵ published a figure of an oyster which he referred to *O. bourgeoisii* but he did not definitely state whether or not the figure represents Rémond's type specimen, which came from Kirker's Pass in Contra Costa County, California. Clark⁶ has figured as *O. bourgeoisii*, an oyster stated to be of common occurrence in the upper Miocene, but the exact locality from which the figured specimen came is not definitely stated. *O. bourgeoisii* appears in his checklist, but under the list of localities accompanying the same, the indication as to locality is omitted. The form figured by Clark is quite distinct from *O. ashleyi* which occurs in the Temblor.

Specimens of oysters in the collections of the California Academy of Sciences, which can apparently be referred to *O. bourgeoisii*, occur in the beds which have been referred to the San Pablo formation in Contra Costa County and at other localities in the Mount Diablo region. Some of the localities are here mentioned. Loc. 27640 (C. A. S.) N. W. $\frac{1}{4}$ Sec. 27, T.3 S., R.3 E., M. D. M. About five miles east of Livermore, Alameda County, California. Loc. 25716 (C. A. S.) Sec. 5, T.3 N., R.3 E., M. D. M., two miles southeast of Greenville, Contra Costa County, California. Loc. 27620 (C. A. S.) Oyster Shell Hill, N. W. corner of Sec. 3, T.3 S., R.3 E., M. D. M. Alameda County, California; Basal San Pablo. Loc. 27631 (C. A. S.) N. E. side of hill 1318, N. E. $\frac{1}{4}$ of N. W. $\frac{1}{4}$ Sec. 15, T.2 S., R.2 E., Alameda County, California.

¹ Jour. Paleo. vol. 2, no. 2, 1928, p. 147, pl. 23, figs. 1, 10.

² Jour. Paleo. vol. 2, no. 2, 1928, p. 144, pl. 22, figs. 2 and 3.

³ Trans. San Diego Soc. Nat. Hist. vol. 5, 1928, p. 135, pl. 15, figs 1 and 2.

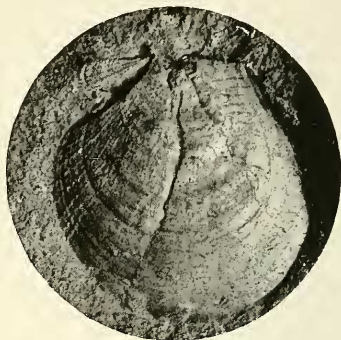
⁴ Proc. Calif. Acad. Sci., vol. 3, 1863, p. 13. "Vicinity of Kirker's Pass, from a late Tertiary bed."

⁵ Geol. Survey Calif., Palaeo. vol. 2, 1866, p. 33, pl. 11, figs. 57, 57a. In the text the locality is given as "Near Kirker's Pass, Contra Costa County; from the Pliocene."

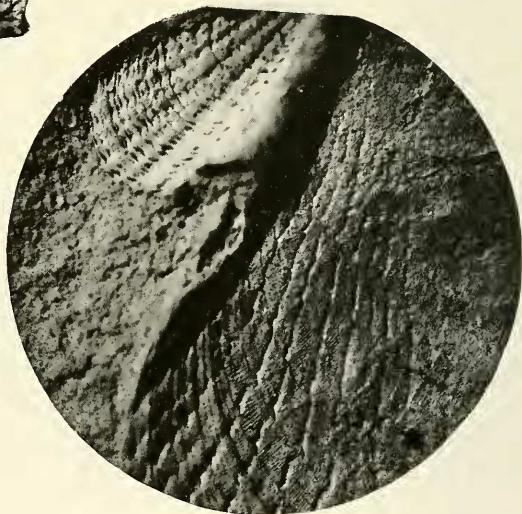
⁶ Univ. Calif. Publ. Bull. Dept. Geol. vol. 8, no. 22, 1915, p. 447, Pl. 43.



1



2



3

PLATE 2

FIG. 1. *Ostrca ashleyi* Hertlein, new species. Paratype, upper valve, No. 6072 (C. A. S. type coll.) from Loc. 1073 (C. A. S.) from forks of large gulch which runs from the north through the middle of the east $\frac{1}{2}$ Sec. 28, T. 28 S., R. 29 E., Kern County, California. About $\frac{1}{2}$ kilometer above falls on central hill slope; G. D. Hanna and J. A. Taff collectors; Temblor, Miocene. Central ligament ridge elevated about 10 mm. above the plane of the hinge.

FIG. 2. *Pecten (Pseudamusium) lillisi* Hertlein, new species. Holotype, impression of right valve, No. 6062 (C. A. S. type coll.), from the same locality as the specimen illustrated on Plate 1, figure 1.

FIG. 3. *Pecten (Pseudamusium) lillisi* Hertlein, new species. Enlarged view of the anterior portion of the specimen in figure 2.

Ostrea titan eucorrugata, new name.

Ostrea titan corrugata Nomland, Univ. Calif. Publ. Bull. Dept. Geol. vol. 10, no. 18, 1917, p. 306, pl. 16, fig. 1; pl. 17, fig. 1; "near middle of southern boundary of N. E. $\frac{1}{4}$ Sec. 10, T.19 S, R.15 E, M. D. B. & M., about fifty feet above base of formation." Santa Margarita formation, upper Miocene.

Not *Ostrea corrugata* Brocchi, Conch. Fossil. Subapennina, vol. 2, 1814, p. 670, pl. 16, figs. 14 and 15; "fossile nel Piacentino."

Not *Ostrea corrugata* Hutton, Catalog. Tert. Moll. & Echin. New Zealand, 1873, p. 35; "Shakespeare Cliff."

Nomland has indicated that this form is "Distinguishable from the typical *Ostrea titan* Conrad which is also found in the Santa Margarita formation by the prominent folds on surface and the greater convexity of lower valve."

Hanna⁷ has already pointed out that the name *corrugata* is preoccupied in the genus *Ostrea* by *O. corrugata* Brocchi. The California form named *corrugata* by Nomland is believed by some workers to have a stratigraphical significance, and is therefore renamed.

Hutton has also used the name *O. corrugata* for a New Zealand fossil shell, which has been renamed *Ostrea huttoni* by Lamy.⁸

Pecten (*Pseudamusium*) *lillisi* Hertlein, new species

Plate 1, figure 1; plate 2, figures 2 and 3

Shell small, of general form of *Pecten pedroanus* Trask; right valve, the anterior ear well defined, set off from the rest of the shell by a well defined groove, a well developed byssal notch is present; anterior ear ornamented by six or seven riblets, which are crossed by imbricating lines of growth; posterior ear unornamented except by fine lines of growth; the anterior portion of the valve ornamented by about ten fine spinose riblets; the posterior portion of the valve unornamented except by fine lines of growth; entire surface of valve covered by fine submicroscopic camp-tonectes striations which cross the radiating riblets. Measurements of holotype, altitude 14.1 mm.; length (approximately) 13 mm.; length of hinge line 9.2 mm.

⁷ Proc. Calif. Acad. Sci. ser. 4, vol. 13, no. 10, 1924, p. 174.

⁸ Jour. de Conchyl. vol. 73, no. 3, 1929, p. 166.

Left valve (paratype), the anterior ear is ornamented by about six to eight fine radial ribs; the surface of the valve is ornamented by fine radiating riblets; entire surface covered by camptonectes striations similar to the right valve.

Holotype: No. 6062 and paratypes, Nos. 6063 and 6064 (C. A. S. type coll.) from Loc. 1874 (C. A. S.) diatomite, Kreyenhagen shale, from S. E. corner of Sec. 35, T.6 S., R.7 E., M. D. M., Stanislaus County, California; on the north side of Crow Creek road. Bedded material exposed in quarry, dip nearly flat. G. D. Hanna and J. A. Taff collectors. Kreyenhagen formation; upper Eocene or lower Oligocene. The holotype and paratypes are excellent impressions in the white diatomaceous shale.

Pecten lillisi may be distinguished from *P. pedroanus* Trask and other fossil and Recent species of small pectens on the west coast of North America, by the small number of delicate spinose ribs which ornament the anterior portion of the right valve, and by the fine submicroscopic camptonectes striations which cover the surface of the shell. The less numerous ribs on the right valve distinguish the new species from *Pecten (Pseudamusium) panamensis* Dall.⁹ Compared to *Pecten (Pseudamusium) reticulus* Dall,¹⁰ the new species differs in the shape of the ears and in the greater number of radiating riblets on the left valve; also the anterior portion of the right valve possesses more radiating riblets than the species described by Dall. No mention is made by Dall in the description, regarding the presence of any camptonectes striations on *P. reticulus*. *Pecten (Pseudamusium) thalassinus* Dall,¹¹ described but apparently unfigured, is said to be ornamented similar to *P. reticulus* but with the sculpture less pronounced. The strong spines on the ribs of the right valve, strongly sculptured ears, and camptonectes striations of *P. lillisi* serve to distinguish it from Dall's species.

⁹ Bull. Mus. Comp. Zool. vol. 43, no. 6, 1908, p. 404, pl. 6, figs. 8 and 10. "Gulf of Panama, in 322 fathoms, mud, bottom temperature 56° F." . . . "ranging from near Acapulco, Mexico, to the Galapagos Islands, in 141 to 885 fathoms, soft bottom, temperature 37°.2 to 53°.5 F."

¹⁰ Bull. Mus. Comp. Zool. vol. 12, no. 6, 1886, p. 221, pl. 5, figs. 8 and 10. "Obtained in 82-123 fms. at Barbados."

¹¹ Bull. Mus. Comp. Zool. vol. 12, no. 6, 1886, p. 221. "80 to 317 fms. off Martha's Vineyard," and "off Havana in 450 fms."